Sixth Grade New Math Core Compared to the Old Math Core
DRAFT 9.10.07

Common to Both (Based on New Language)	New Core Only	Old Core Only
Standard I: Students will expand number sense to include operations with rational numbers. **Objective 1: Represent rational numbers in a variety of ways.** • Recognize a rational number as a ratio of two integers, a to b, where b is not equal to zero. • Change whole numbers with exponents to standard form (e.g., 24 = 16) and recognize that any non-zero whole number to the zero power equals 1 (e.g., 90 = 1). • Write a whole number in expanded form using exponents (e.g., 876,539 = 8 x 105 + 7 x 104 + 6 x 103 + 5 x 102 + 3 x 101 + 9 x 100). • Express numbers in scientific notation using positive powers of ten.	• Recognize a rational number as a ratio of two integers, a to b, where b is not equal to zero.	• Read and write numerals from thousandths to one billion.
Objective 2: Explain relationships and equivalencies among rational numbers. • Place rational numbers on the number line. • Compare and order rational numbers, including positive and negative mixed fractions and decimals, using a variety of methods and symbols, including the number line and finding common denominators. • Find equivalent forms for common fractions, decimals, percents, and ratios, including repeating or terminating decimals. • Relate percents less than 1% or greater than 100% to equivalent fractions, decimals, whole numbers, and mixed numbers. • Recognize that the sum of an integer and its additive inverse is zero.		• Divide regions, sets of objects, and line segments into equal parts using a variety of models and illustrations. • Name and write a fraction to represent a portion of a unit whole for halves, thirds, fourths, fifths, sixths, eighths, tenths, twelfths, and sixteenths. • Write a fraction or ratio in simplest form.

Objective 3: Use number theory concepts to find prime factorizations, least common multiples, and greatest common factors. • Determine whether whole numbers to 100 are prime, composite, or neither. • Find the prime factorization of composite numbers to 100. • Find the greatest common factor and least common multiple for two numbers using a variety of methods (e.g., list of multiples, prime factorization).	Extension: • Prime factorization of composite numbers to 100.	
	Objective 4: Model and illustrate meanings of operations and describe how they relate. • Relate fractions to multiplication and division and use this relationship to explain procedures for multiplying and dividing fractions. • Recognize that ratios derive from pairs of rows in the multiplication table and connect with equivalent fractions. • Give mixed number and decimal solutions to division problems with whole numbers.	• Represent division of a multi-digit dividend by two-digit divisors, including decimals, using models, pictures, and symbols. • Model addition, subtraction, multiplication, and division of fractions and decimals in a variety of ways. • Apply rules of divisibility. • Select or write a number sentence that can be used to solve a multi-step problem and write a word problem when given a two-step expression or equation.
Objective 5: Solve problems involving multiple steps. • Select appropriate methods to solve a multi-step problem involving multiplication and division of fractions and decimals. • Use estimation or calculation to compute results, depending on the context and numbers involved in the problem. • Solve problems involving ratios and proportions.	• Use estimation to determine whether results obtained using a calculator are reasonable.	
Objective 6: Demonstrate proficiency with the four operations, with positive rational numbers, and with addition and subtraction of integers. • Multiply and divide a multi-digit number by a two-digit number, including decimals. • Add, subtract, multiply, and divide fractions and mixed numbers. • Add and subtract integers.		• Add and subtract decimals to the thousandths place. • Model addition and subtraction of integers using manipulatives and a number line.

Standard II: Students will use patterns, relations, and algebraic expressions to represent and analyze mathematical problems and number relationships. **Objective 1: Analyze algebraic expressions, tables, and graphs to determine patterns, relations, and rules.** • Describe simple relationships by creating and analyzing tables, equations, and expressions. • Draw a graph and write an equation from a table of values. • Draw a graph and create a table of values from an equation.		
Objective 2: Write, interpret, and use mathematical expressions, equations, and formulas to represent and solve problems that correspond to given situations. • Solve single variable linear equations using a variety of strategies. • Evaluate and simplify expressions and formulas, substituting given values for the variables (e.g., $2x + 4$; $x = 2$; therefore, $2(2) + 4 = 8$).	• Recognize that expressions in different forms can be equivalent and rewrite an expression to represent a quantity in a different way.	• Recognize that if the product is zero, then one or more factors equal zero.
Standard III: Students will use spatial and logical reasoning to recognize, describe, and analyze geometric shapes and principles. **Objective 1: Identify and analyze attributes and properties of geometric shapes to solve problems.** • Identify the midpoint of a line segment and the center and circumference of a circle.	• Identify angles as vertical, adjacent, complementary, or supplementary and provide descriptions of these terms. • Develop and use the properties of complementary and supplementary angles and the sum of the angles of a triangle to solve problems involving an unknown angle in a triangle or quadrilateral.	• Identify concave and convex polygons. • Identify the radius and diameter of a circle. • Identify the number of faces, edges, and vertices of pyramids and prisms.
Objective 2: Visualize and identify geometric shapes after applying transformations on a coordinate plane. • Rotate a polygon about the origin by a multiple of 90° and identify the location of the new vertices. • Translate a polygon either horizontally or vertically on a coordinate grid and identify the location of the new vertices. • Reflect a polygon across either the x- or y-axis and identify the location of the new vertices.		**Objective 2: Specify locations and describe spatial relationships using coordinate geometry.** • Graph points defined by ordered pairs in all quadrants. • Write the ordered pair for a point in any quadrant.

Standard IV: Students will understand and apply measurement tools and techniques and find the circumference and area of a circle. **Objective 1: Describe and find the circumference and area of a circle.** • Find the circumference of a circle using a formula. • Describe pi as the ratio of the circumference to the diameter of a circle.	• Explore the relationship between the radius and diameter of a circle to the circle's circumference to develop the formula for circumference. • Decompose a circle into a number of wedges and rearrange the wedges into a shape that approximates a parallelogram to develop the formula for the area of a circle. • Find the area of a circle using a formula.	• Estimate length, volume, weight, and area using metric and customary units.
Objective 2: Identify and describe measurable attributes of objects and units of measurement, and solve problems involving measurement. • Recognize that measurements are approximations and describe how the size of the unit used in measuring affects the precision. • Compare a meter to a yard, a liter to a quart, and a kilometer to a mile.	• Convert units of measurement within the metric system and convert units of measurement. • Determine when it is appropriate to estimate or use precise measurement when solving problems. • Derive and use the formula to determine the surface area and volume of a cylinder.	• Measure length to the nearest one-sixteenth of an inch and to the nearest millimeter. • Estimate and measure an angle to the nearest degree. • Calculate elapsed time across a.m. and p.m. time periods. • Calculate the areas of triangles, rectangles, and parallelograms using given formulas. • Calculate the surface area and volume of right, rectangular prisms using given formulas.
Standard V: Students will analyze, draw conclusions, and make predictions based upon data and apply basic concepts of probability. **Objective 1: Design investigations to reach conclusions using statistical methods to make inferences based on data.** • Design investigations to answer questions. • Extend data display and comparisons to include scatter plots and circle graphs. • Compare two similar sets of data on the same graph and compare two graphs representing the same set of data. • Recognize that changing the scale influences the appearance of a display of data. • Propose and justify inferences and predictions based on data.		

Objective 2: Apply basic concepts of probability and justify outcomes. • Write the results of a probability experiment as a fraction between zero and one, or an equivalent percent. • Compare experimental results with theoretical results (e.g., experimental: 7 out 10 tails; whereas, theoretical 5 out of 10 tails). • Compare individual, small group, and large group results of a probability experiment in order to more accurately estimate the actual probabilities.		